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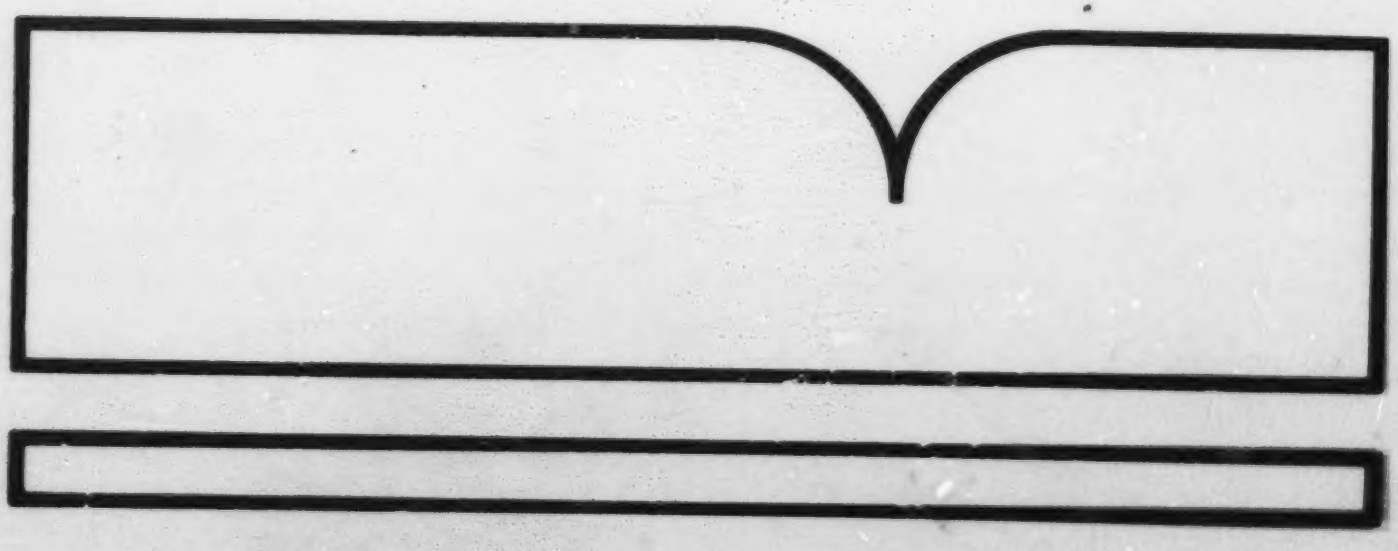
Processing Hazardous Materials Risk Information at the Local Level

Virginia Polytechnic Inst. and State Univ., Blacksburg

Prepared for:

Environmental Protection Agency, Washington, DC

Dec 88



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Processing Hazardous Materials Risk Information at the Local Level

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This pilot study examines the role of Local Emergency Planning Committees (LEPCs, set up under Title III of the Superfund Amendments and Reauthorization Act) in communicating about the risks from hazardous wastes in Superfund or RCRA sites as well as the risks from hazardous substances covered under the Community Right-to-know Law. This phase evaluated the usefulness of certain hazard analysis materials to the LEPCs. Eighty LEPCs in Virginia were surveyed about their activities and their perceptions of their responsibilities for communicating to their communities about Title III risks. The major conclusion for Phase I is that LEPCs were emphasizing the development of their local emergency plans. Communicating with the local citizenry was a secondary concern at that time. Phase II is examining how things have changed across 10 states.

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hazardous materials risk communication
who explains risks from hazardous materials?

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PROCESSING HAZARDOUS MATERIALS RISK INFORMATION

AT THE LOCAL LEVEL

Final Report on Phase One of

COMMUNITY INTERPRETATION OF
HAZARDOUS MATERIALS RISK INFORMATION

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE
***and* OFFICE OF POLICY, PLANNING, AND EVALUATION**

Cooperative Agreement No. 814921

By

UNIVERSITY CENTER FOR
ENVIRONMENTAL & HAZARDOUS MATERIALS STUDIES

VIRGINIA POLYTECHNIC INSTITUTE & STATE UNIVERSITY

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INTRODUCTION

This is the final report on Phase 1 of this project, conducted between March and October, 1988, under Cooperative Agreement No. 814921. It addresses the issue of environmental risk communication under Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). That act calls for the creation in each state of Local Emergency Planning Committees (LEPCs) which are to include representatives of local government; police, fire, hospital and other emergency response and public health agencies; facilities likely to use hazardous materials covered by SARA; community groups and the media. Each LEPC's initial responsibility has been to develop a comprehensive plan for responding effectively to emergencies created by the release of hazardous chemicals into the environment. These plans were to be completed by October 17, 1988. In addition to developing the plan, the committees have an important public information function. The LEPCs are to receive and store information on chemical hazards in the community from any facility that handles substances identified as hazardous by the Environmental Protection Agency (EPA). They are also charged with establishing and administering procedures for responding to public requests for information about these environmental hazards. This study examines a sample of Virginia LEPCs in their role as risk communicators under Title III.

OBJECTIVES

The objectives of Phase I were as follows:

1. To begin to explore the Title III process as an example of an approach to raising community awareness of risks associated with hazardous materials and providing mechanisms through which citizens can address these risks.

2. To evaluate the effectiveness of EPA's Hazards Analysis Presentation as an aid to community groups such as LEPCs.

ACTIVITIES

This section provides an overview of the Phase 1 activities.

1. Attend a preliminary Hazards Analysis Presentation to the Hazards Analysis Subcommittee of the Washington, D.C. LEPC.

   This gave us a chance to see an early version of the presentation, as well as to be introduced to CAMEO. (CAMEO has not, however, been a large part of our work since then.) Following this presentation, we were able to provide feedback as to how it might be strengthened.

2. Select four communities in which to evaluate the hazards analysis presentation and conduct focus group discussions on the Title III planning process.

   The number of communities had been determined as a function of time and budget constraints. We also knew that we wanted a varied selection, including urban and rural areas, and areas with both high and low intensity of facilities having hazardous materials. Given the low number and wide variety, we elected to pick four communities in Virginia. This avoided adding another layer of variables (such as different state or EPA region policies) allowed us to capitalize on our contacts within the state, and reduced the costs of the research.

   The four communities selected were:

   - Urban, low intensity - Prince William County/Cities of Manassas, Manassas Park.
     Estimated 1985 population 195,400 (total); 169,000 (county); 19,500 (Manassas); 6,900 (Manassas Park). Median income 1979 $20-25,000.
     Very rapid growth. DC suburban community. Electronics (IBM); office; light industry.

   - Urban, high intensity - City of Richmond.
     Estimated 1985 population 217,200. Median income 1979 $13,606.
     State capital. Major banking. Largest manufacturing concentration in Virginia. Tobacco processing, printing, paper, apparel, chemicals.

- Rural, low intensity - Franklin County.

  Estimated 1985 population 37,300. Median income 1979 $14,892.

  Lumber, wood products, furniture, apparel.

- Rural, high intensity - Rockingham County/City of Harrisonburg.

  Estimated 1985 population 80,100 (total); 53,600 (county); 26,500 (Harrisonburg). Median income 1979 $13-16,000.

  Major poultry farming/processing (especially turkeys); other food processing; apparel; chemicals; James Madison University.

3. Gather information on Virginia LEPCs.

   Since we were attempting, among other things, to determine whether the Hazards Analysis Presentation was useful to groups such as LEPCs, we decided it was necessary to learn more about the members and the nature of their needs (both from their perspective and ours). Given that the four selected communities were all in Virginia, we sought to collect data on other Virginia LEPCs to provide a context for interpreting information from the case studies. Details of theis data collection effort are provided in the Methodology section, below.

4. Evaluate the Hazards Analysis Presentation, and conduct focus group discussions, in the four communities.

   Results of the evaluation were presented in a separate report which is attached to this report as Appendix B. Our observations on the Hazards Analysis Presentation are not discussed in the body of the report. However, the focus group discussions, which were intended to elicit the members' thoughts regarding both the presentation and the Title III process, provided valuable insights which are discussed in subsequent sections.

METHODOLOGY

Since the LEPCs are new institutions, there existed no prior research to guide us in identifying key questions to be asked or framing hypotheses to be tested. As a result, we designed an exploratory data collection instrument intended to produce a description of the LEPCs and to discover patterns which could suggest lines for future research.

In April, 1988, packets were sent to the Chairs of the 80 LEPCs that had been formed in Virginia by that date. Each packet contained 1) an LEPC Information Form designed to gather data on the LEPCs as organizations, 2) questionnaires for the individual LEPC members, and 3) a supporting letter from the Virginia Emergency Response Council., (The data collection instruments and cover letters are reproduced in Appendix B of this report.) LEPC Chairs were asked to distribute the individual questionnaires to the members of their organization, ask that they fill them out, collect the completed forms and return them along with the LEPC Information Form to us in an envelope provided for that purpose. To encourage frank answers to questions about the LEPC and its leadership, no identifiers were placed on the members' questionnaires and we asked that the completed instruments be placed in sealed envelopes before being returned to the chair in order to ensure that individual responses would be confidential.

We followed the initial mailing with additional letters and with phone calls to urge a response. In the end, we received questionnaires from 31 different LEPCs for an organizational response rate of 35%. The LEPCs that returned information forms reported a total of 493 members. The 251 individual questionnaires we received, therefore, constitue a 51% sample of all the members of the responding organizations. There was, however, a great deal of variation from committee to committee in the percent of reported members who completed questionnaires. Conversations with LEPC members and the response of some Chairs to our request suggest that one plausible explanation for this rather low response from the organizations is that many LEPCs were quite young at the time of our study and did not feel that they could provide answers to many of the questions. Other Chairs may have felt that they were asking so much of their members in their efforts to develop the plan by the October deadline that they could not justify also asking them to complete the questionnaire.

Our "sample" resulted from an attempt to achieve a census of state LEPCs rather than from the application of random sampling techniques. As a result, we can not speak with precision of the statistical representativeness of our sample and we can not rule out the possibility that those who responded are, in some ways, unrepresentative of the population of LEPC members. We can, however, argue that there is a logical, if not a statistical, basis for believing our sample to be at least typical of LEPC members. In the first place, the organizations from which they come are located in every region of the state and in both urban and rural localities with both high and low concentrations of facilities with hazardous materials. In addition, the profile of those LEPC members who responded is consistent with what a knowledge of emergency planning and the requirements of SARA would lead one to expect. Finally, the response patterns we describe below are generally so strong that it is highly unlikely that they would have occurred by chance in a sample of this type if they did not exist in the larger population. As a result, we feel comfortable in making broad generalizations about the LEPCs and their members from these data. It is important, however, to recognize the limitations of this study. The sample was confined to one state, the sampling technique employed encouraged responses primarily from more committed members of more active organizations, and responses came from a relatively small proportion of the committees. Together, these facts mean that it would be a mistake to predict precise relationships or response patterns in all LEPCs from these data. Accordingly, we will focus on general patterns, will be cautious in making generalizations and will treat our findings as suggestive rather than definitive.

FINDINGS

LEPC STRUCTURE AND OPERATION

Information on the structure, organization and activities of the LEPCs comes from the LEPC Information Forms completed by the Chairs of the individual LEPCs. Data on the "organizational climate", procedures, and perceived capacity of the committees can be derived by aggregating responses of individual members to our questionnaire.

Structure

Twenty nine of the committees that sent in member responses filed LEPC Information Forms. These indicate that, at the time of the study, the LEPCs had been in existence for an average of six months and had 18 members. In compliance with the legislation that created them, 90% had appointed Community Information Coordinators and 93% had appointed Community Emergency Coordinators.

We asked what subcommittees had been created by the LEPCs on the assumption that their subcommittee structure could suggest how they defined their responsibilities. The following table shows the distribution of subcommittees as reported on the LEPC Information Forms. It indicates that there was little consensus on how best to organize the work of the LEPCs since there is no set of subcommittees common to all organizations. Almost one fourth of these LEPCs had formed no subcommittees. Generally, the larger LEPCs and those serving more urbanized areas reported more subcommittees while smaller and more rural LEPCs exhibited less division of labor.

TYPE OF SUBCOMMITTEE	PERCENT OF LEPCs THAT HAVE FORMED SUBCOMMITTEE
Public Relations	34%
Hazards Analysis	34%
Emergency Planning	31%
Response Capacity	31%
Miscellaneous	28%
Internal Affairs	24%
Transportation	17%
Public Education	17%
Media Relations	10%
Site Identification	10%
Response Training	10%
Medical Preparation	6%

Recognizing the centrality of the material safety data sheets (MSDSs) to the task of the LEPCs, we asked how many of these forms each committee had received from local firms and how many firms were to report to each LEPC. Individual organizations reported having received from 0 to 10,000 material safety data sheets from between one and 200 local firms. The median LEPC reported receiving a total of 37 data sheets from 15 facilities (though means were much higher because of a few very high estimates). When asked what kind of system they had developed to record and retrieve the information contained on the MSDSs, 90% of the responding LEPCs reported having only a paper record while 3% reported a combination of computerized and paper systems and 7% indicated that they had NO system yet in place. This result indicates, at this stage of SARA's implementation, a very limited capacity for efficiently processing information on hazardous materials in their communities. In addition, we found that four LEPC Chairs had no idea how many facilities were to report to them and another nine gave what we consider to be unrealistically low estimates given the level of economic development in their areas.

We asked which of three phrases best described the stage of the planning process which the committees had reached. (See question 9 on the information sheet.) The results are shown in the table that follows.

STAGE OF PLANNING	PERCENT OF LEPCs
Gathering information and designing the process	21%
Planning well under way	41%
Circulating drafts of the plan	10%
Close to final draft of the plan	21%
Other description of stage	7%

This distribution reflects the fact that our study came relatively early in the planning process, but indicates that our data come from organizations at all stages of the planning process. The stage the LEPC had reached in the process was statisticaly related only to the age of the committee, suggesting that no organizational structure had any particular advantage in moving the planning process along more rapidly than any other.

MEMBERS' PERCEPTIONS

If we turn to the more subjective characteristics of the LEPCs revealed by their members' responses to the questionnaire, we can ask about members' perceptions of 1) the capacity of the committees for performing the functions assigned to them, 2) the resources available to the LEPCs, and 3) the internal procedures of the organizations.

Before addressing these issues, however, a methodological explanation is called for. In what follows we treat all 251 respondents as a single sample of LEPC members rather than breaking them into 31 separate samples of specific committees. Examination of the responses on a committee-by-committee basis gave us both a reason for not analyzing them as separate samples and a justification for grouping them into a single sample. First, there were so few responses from some LEPCs that we would run the risk of drawing very inaccurate conclusions about the whole committee if we relied

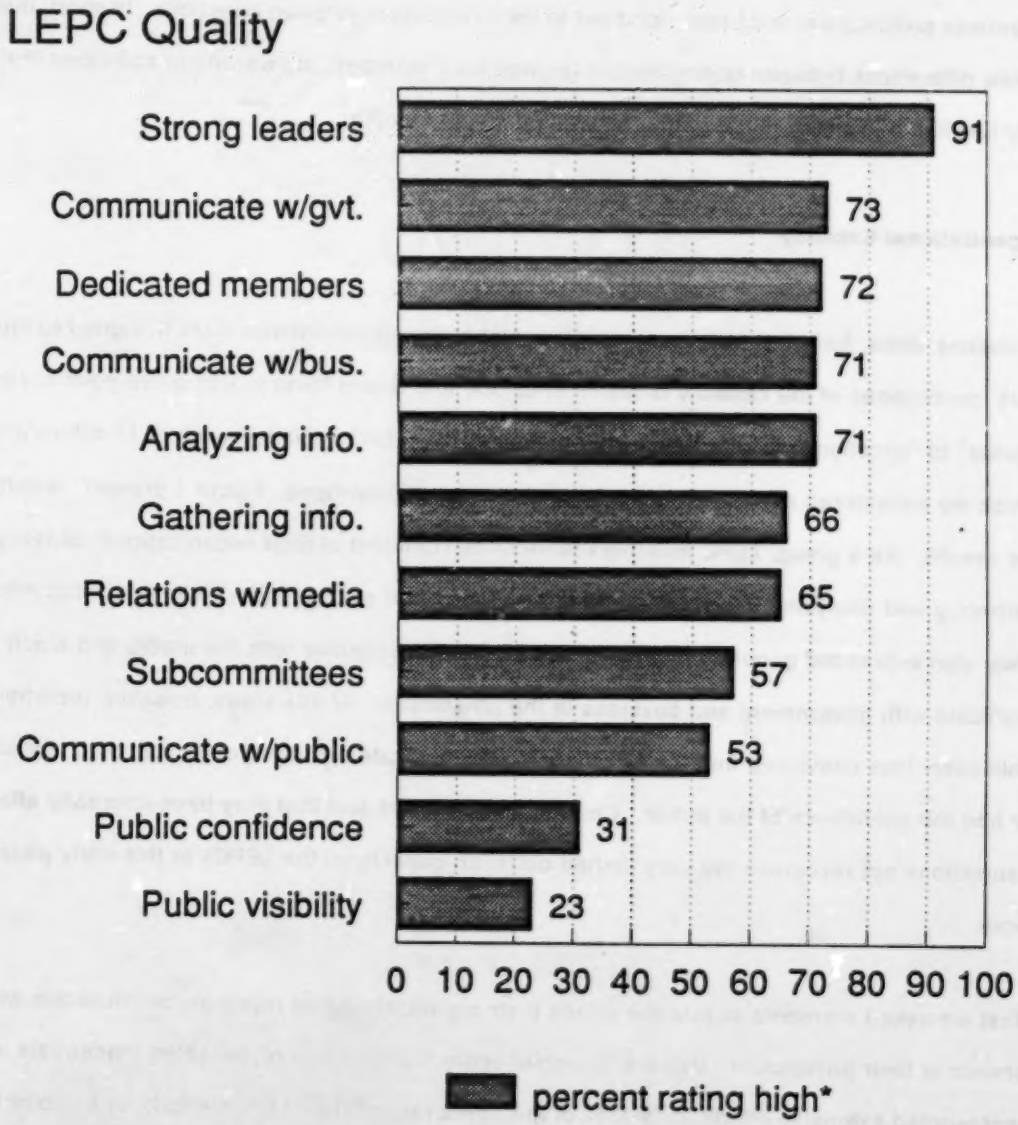
on our respondents as representative samples of the individual LEPCs. This argued against committee-by-committee analysis. Second, we found no important differences among the response patterns in the different LEPCs. While a few committees stood out as distinctive in their answers to a few specific questions, there were no consistent patterns of distinctiveness -- those that gave atypical answers to one question were not consistently atypical and there was no visible pattern to the type of questions on which individual committees stood out or in the type of committees (urban/rural; more/less professional; etc.) that stood out in their responses to given questions. In short, there were so few differences between committees in the way their members answered our questions that we feel fully justified in treating these respondents as a single sample.

Organizational Capacity

Questions three, four, five and seven on the membership questionnaire were designed to tap members' perceptions of the capacity of their LEPC. We first asked them to use a five-point scale ("inadequate" to "excellent") to rate the degree to which their LEPC exhibited each of 11 different features which we considered necessary to the organizations' effectiveness. Figure 1 presents a summary of the results. As a group, LEPC members were quite confident of their organizations' capacity for gathering and analyzing information and felt that they had strong leaders and dedicated members. They also expressed general confidence in their LEPCs' relations with the media and ability to communicate with government and business in the jurisdiction. At this stage, however, members were noticeably less convinced that the LEPC could communicate with the public, had high public visibility or had the confidence of the public. Clearly, the members feel that they have internally effective organizations but recognize the very limited outreach capacity of the LEPCs in this early phase of their work.

Next we asked members to rate the efforts their organization had made to communicate with businesses in their jurisdiction. Using a five-point scale in which one represented inadequate and five represented extensive efforts, only 11% of members ranked their LEPCs efforts as a one or two (poor) while 52% rated the efforts at a four or five (good). In addition, we asked members to rate the cooperation their LEPC received from the business community on a five-point scale and found that only 14% called it poor or inadequate while 41% rated it as adequate and 45% termed it good to excellent. This pattern was generally repeated when we examined responses from the individual LEPCs since

FIGURE 1
Members' Assessment of LEPC



*% rating 4 or 5 on 5-point scale

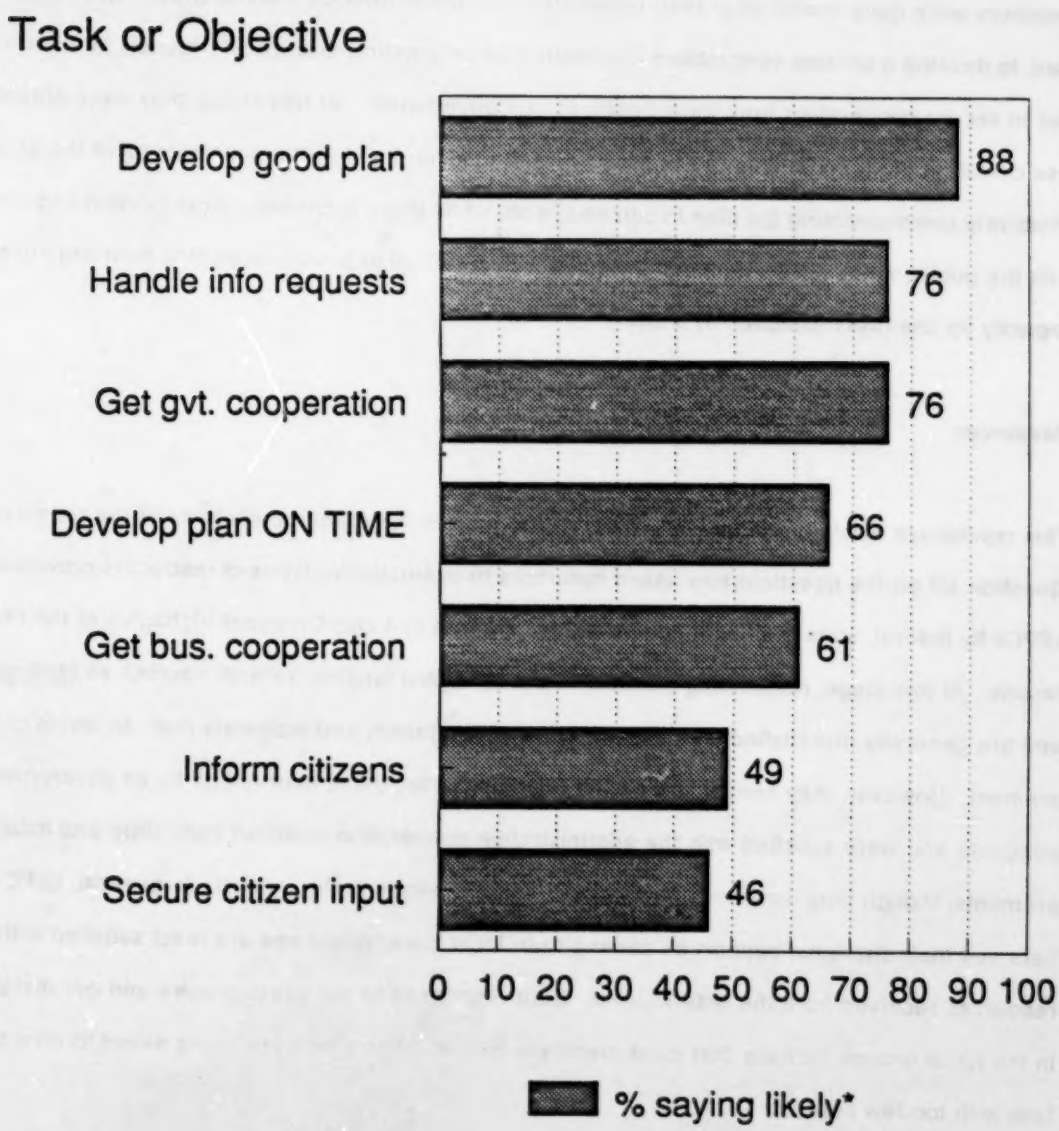
neither the positive nor negative evaluations were concentrated in a few organizations. Overall, the results suggest general satisfaction with the relationship between the LEPCs and businesses though there is clearly room for improvement in the minds of a significant minority of members.

We next tried to assess organizational capacity by asking members to evaluate their LEPCs' chances of reaching six goals. (See question 7 on the questionnaire). Figure 2 summarizes the results. Most members were quite confident of their committee's ability to develop the comprehensive response plan, to develop it **on time**, to establish procedures for responding to citizens' requests for information, and to secure cooperation from local business and government. At this stage, they were noticeably less confident of their chances of securing adequate citizen input in the development of the plan or effectively communicating the plan to citizens. In all, while there is concern about funding and contacts with the public, most LEPC members exhibited a "can do" attitude with respect to their organizations' capacity for the tasks assigned to them.

Resources

This confidence exists in the face of a pessimistic view of the resource situation of the organizations. Question six on the questionnaire asked members to evaluate five types of resources provided to the LEPCs by federal, state and local governments. Figures 3, 4 and 5 present highlights of the results results. At this stage, responding members tend to regard funding from all sources as <u>inadequate</u> and are generally dissatisfied with the provision of equipment and materials from all levels of government. However, they tended to rate the provision of technical information by all governments as adequate and were satisfied with the administrative cooperation received from state and local governments, though they were less pleased with federal efforts in this regard. In general, LEPC members see their strongest support as coming from local government and are least satisfied with the resources received from the federal level. Both responses to the questionnaire and our discussions in the focus groups indicate that most members feel as though they are being asked to do a difficult task with too few resources.

FIGURE 2
Likelyhood of LEPC Success



*% rating 4 or 5 on 5-point scale

FIGURE 3
Perceived Local Support

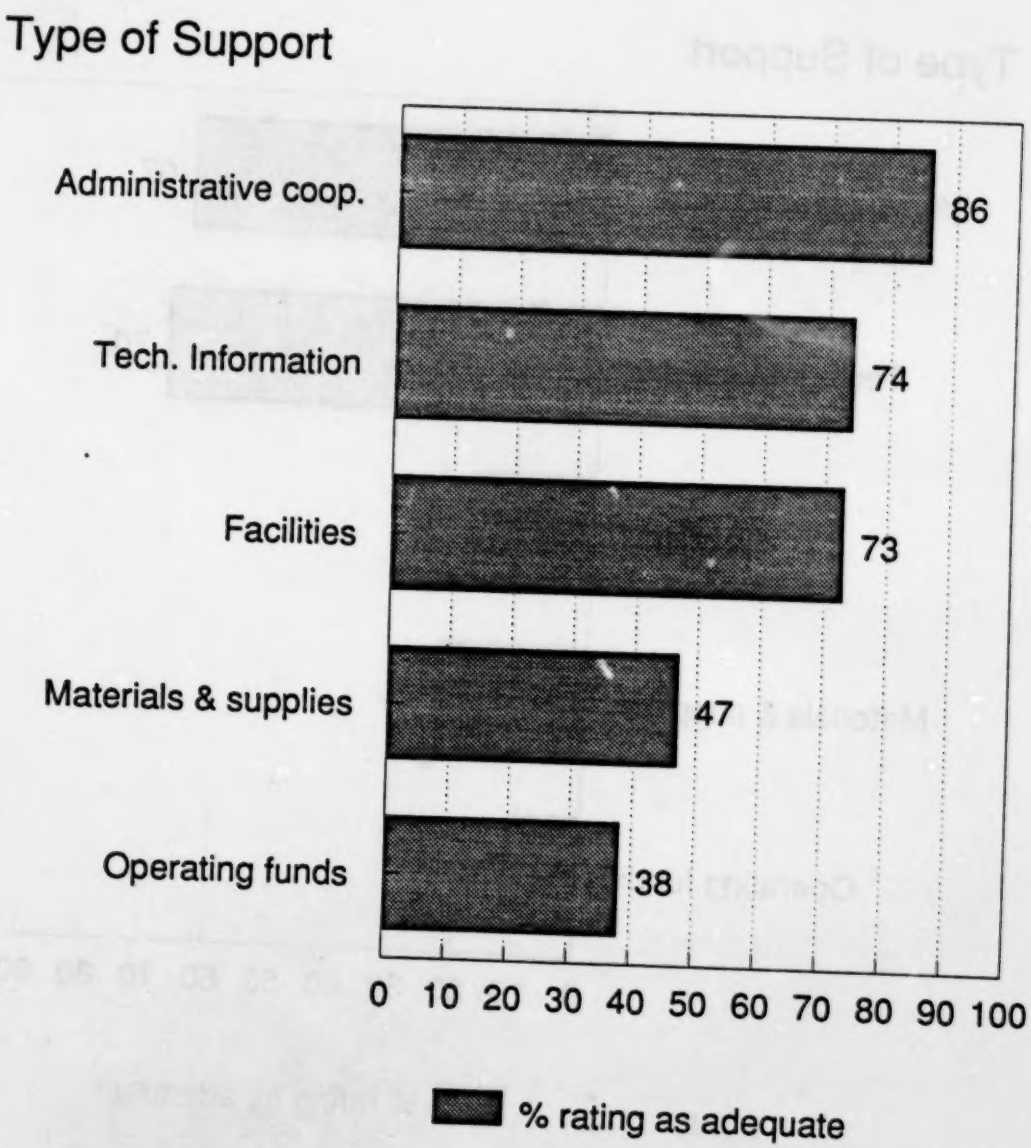


FIGURE 4
Perceived State Support

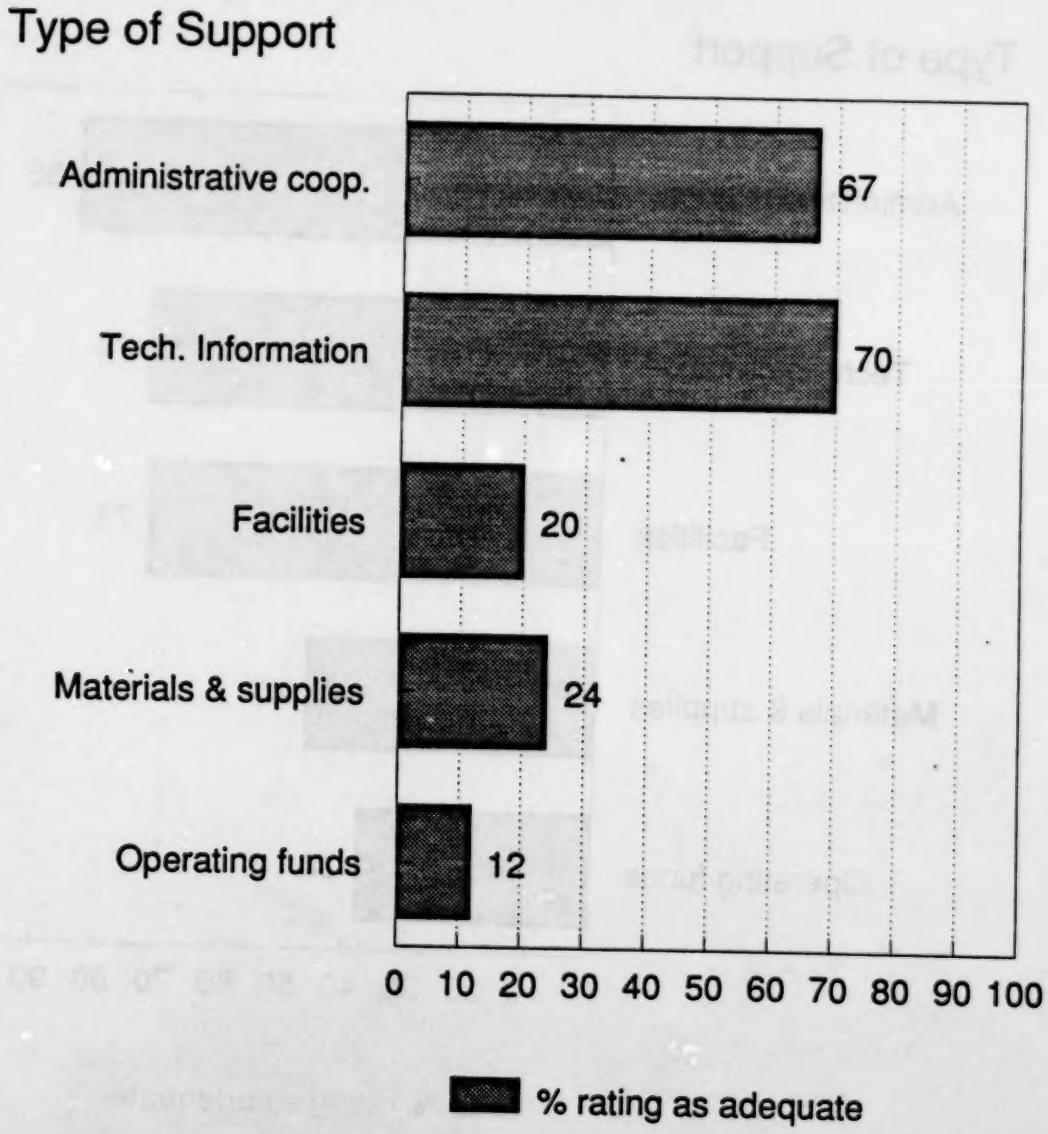
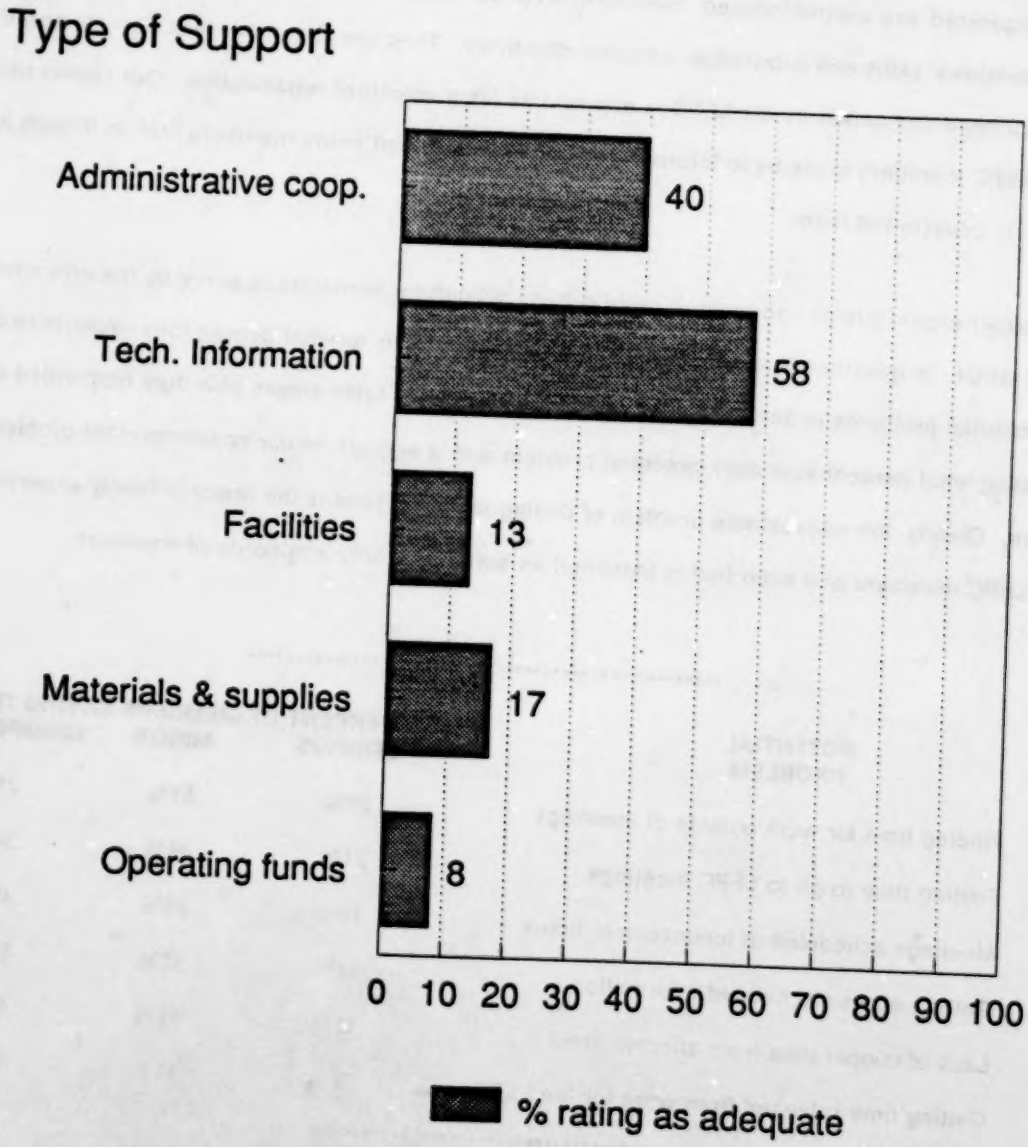


FIGURE 5
Perceived Federal Support



Internal Procedures

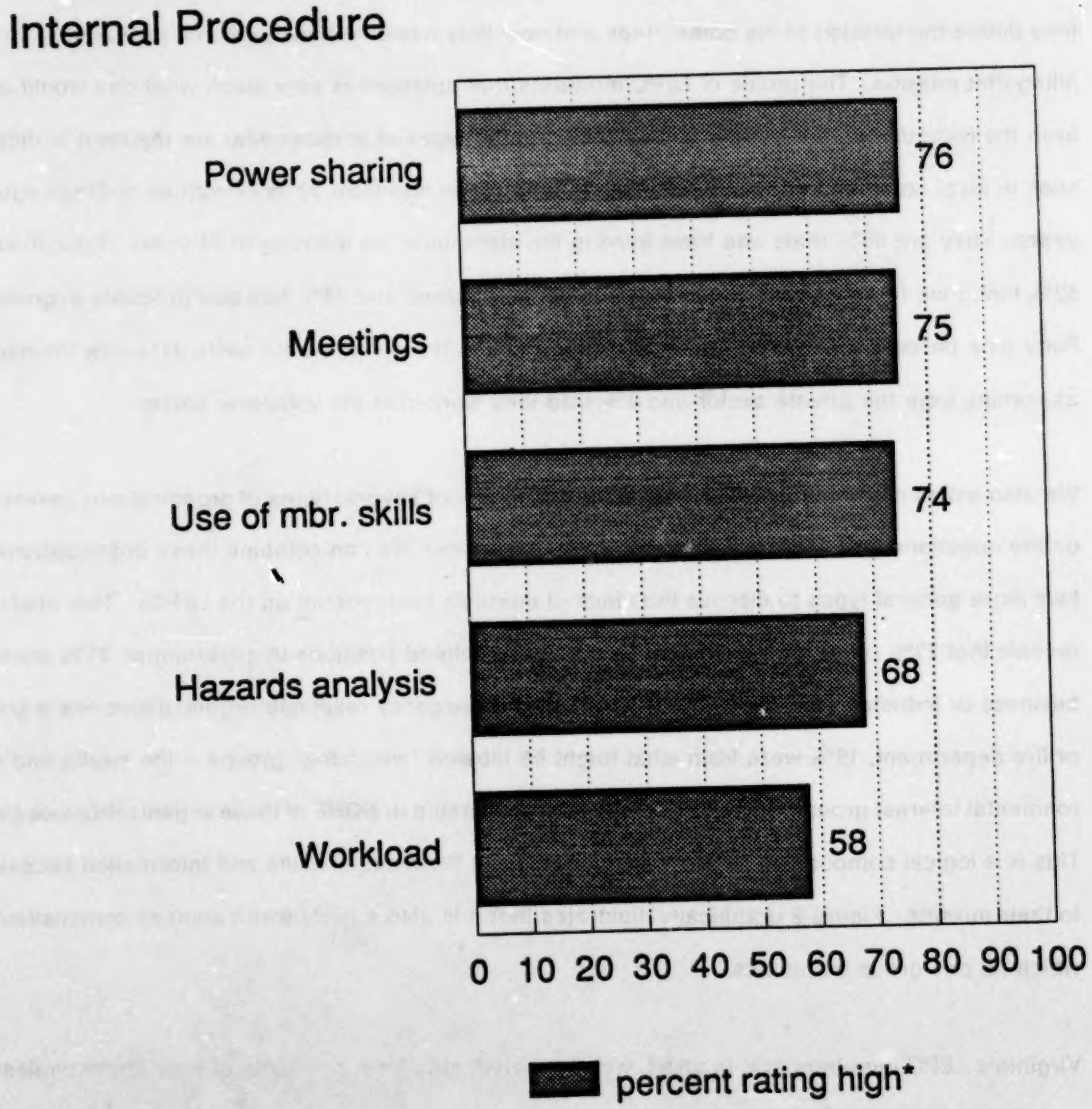
Question 8 sought to assess members' evaluation of the operations of their LEPCs by asking them to agree or disagree with a series of questions about the organization. The results, summarized in Figure 6, indicate that members generally agree that LEPC decisions are broadly based, meetings are well organized and clearly focused, members have the ability to conduct valid hazards analyses and that members' skills and knowledge are used effectively. They are noticeably less likely to agree that the workload demanded by the LEPC is appropriate for a volunteer organization. Our conversations with LEPC members leads us to interpret this as indicating that many members feel as though too much is expected of them.

Volunteer organizations can make it more or less difficult for members to serve by the procedures they adopt. In question 18 we asked LEPC members to tell us to what degree they experienced a set of potential problems in serving on the LEPC. The following table shows how they responded by indicating what percent said each potential problem was a serious, minor or unimportant problem for them. Clearly, the unavoidable problem of finding sufficient time is the major difficulty experienced by LEPC members and even that is identified as serious by only a minority of members.

POTENTIAL PROBLEM	PERCENT OF MEMBERS SAYING IT IS: SERIOUS	MINOR	UNIMPORTANT
Finding time for work outside of meetings	28%	51%	21%
Finding time to go to LEPC meetings	21%	46%	34%
Meetings scheduled at inconvenient times	19%	36%	45%
Getting access to needed information	14%	35%	51%
Lack of cooperation from affected firms	12%	31%	56%
Getting time released from work for the LEPC	7%	11%	82%

Overall, these results suggest that members perceive the LEPCs as strong organizations with capable members, adequate capacity and good internal arrangements. While they are concerned about the adequacy of the resources available to them and do not feel that the LEPC is well-connected to the

FIGURE 6
Assessment of LEPC Procedures



*% scoring 4 or 5 on 5-point scale

public, they appear to be confident of support from local business and government and do NOT appear to be overwhelmed by the magnitude of the task before them.

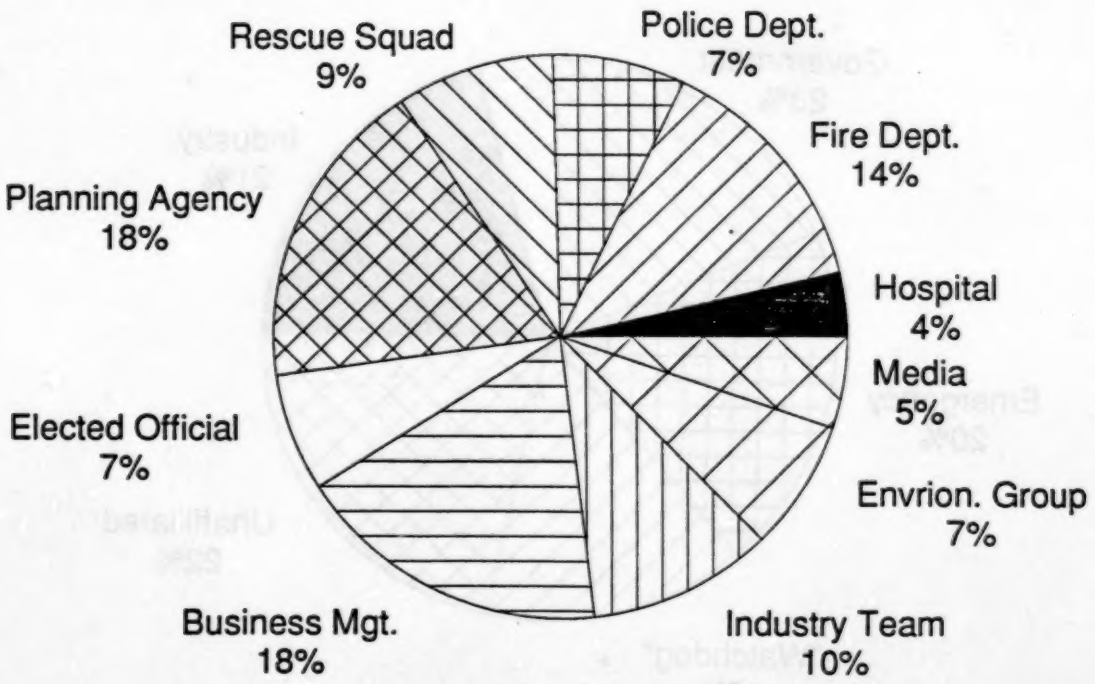
MEMBERSHIP COMPOSITION

Since the LEPCs **are** their members, we turn next to a series of questions about who they are, how they define the mission of the committees and how they evaluate their personal preparation for fulfilling that mission. The profile of LEPC members that emerged is very much what one would expect from the technical nature of their central task and the types of persons who are involved in these issues in local communities. As individuals, they range in age from 22 to 77 with an average age of 46 years. They are 86% male and have lived in the community an average of 21 years. Educationally, 89% had gone to college, 61% had earned college degrees and 38% had postgraduate degrees. Forty nine percent considered their occupation to be in the public sector while 41% saw themselves as coming from the private sector and 9% said they worked in the volunteer sector.

We also asked members whether they belonged to any of several types of organizations (question 15 on the questionnaire). Figure 7 presents their responses. We can combine these organizations into four more general types to discuss the kinds of interests represented on the LEPCs. This analysis reveals that 23% of the members held elected or appointed positions in government, 21% were from business or industry, 20% were from public sector emergency response organizations like a police or fire department, 15% were from what might be labeled "watchdog" groups -- the media and environmental interest groups -- and 22% reported membership in NONE of these organizations or groups. This is a logical composition for the committees given the kinds of skills and information necessary to their mission. Figure 8 graphically illustrates that it is also a fairly well-balanced composition in which no one group dominates.

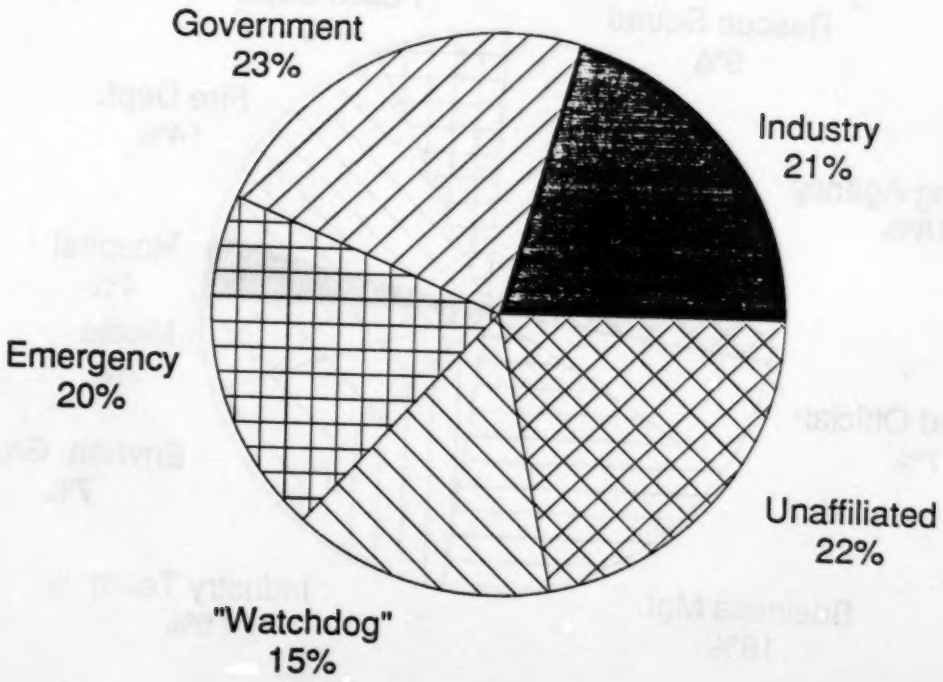
Virginia's LEPC members are, in short, well-educated, long-term residents of their communities with occupational backgrounds that seem appropriate to the job of the LEPC. Clearly they are NOT a cross section of the communities they serve. They are more male, better educated, more professional, more likely to be associated with government and probably more middle-age than would be expected from a representative sample of the general public. They may, therefore, not accurately reflect the opinions of their communities. However, this composition of the committees seems to be dictated to

FIGURE 7
LEPC Members Affiliations



Members of each group on LEPC

FIGURE 8
LEPC Members Backgrounds



LEPC members from each group

some degree by the nature of their main mission and there is little reason to anticipate systematic bias on the committees as a result of who is included and excluded. We will address this topic in more detail below, but for now we can note that business representatives do not dominate the committees numerically and there seem to be ample potential representatives of the public interest on the committees in the members who are from public sector organizations and watchdog groups as well as "unaffiliated" individuals who are not likely to have any special interest in hazardous materials management.

How involved are these members in the LEPC and what does it require of them? In terms of their length of service, 30% had been on the LEPC for less than three months, 28% had been members for three to six months, and 42% had served for over six months. In terms of the offices they held in the committee, 9% of our respondents were LEPC Chairs, 7% served as Community Information Coordinator, 10% served as Community Emergency Coordinator, and 13% were subcommittee chairs. What we have, therefore, is a sample which probably over-represents the more active members of the organizations simply because these people were more likely to have enough interest to take the time to complete the questionnaire.

Even these relatively long-term, active members reported attending remarkably few meetings of the full LEPC. Fully 55% had attended three or fewer meetings and only 5% reported attending ten or more meetings. We also asked how much time members gave to various LEPC activities each month. (See question 13.) The answers are summarized in the following list of the average numbers of hours devoted to different tasks. We must caution that the mean response is somewhat inflated by the very high number of hours reported by a very few respondents in each category and that all of these responses are probably high because our sample contains an unusually high percentage of LEPC officers. It is also important to note that members could report allocating time to more than one activity so the total number of hours per month may be much higher than any one category indicates. In fact, members reported spending an average of 21.3 hours per month on all activities combined.

ACTIVITY	AVERAGE HOURS SPENT PER MONTH
Attending training sessions	4.6
Studying hazardous material issues	4.2
Gathering information	3.9
Attending LEPC meetings	3.1
Evaluating information	2.2
Planning meetings	2.1
Coordinating with other organizations	1.9
Informing the public of LEPC activities	.8
Seeking public input	.7

The extent of members' investment in learning about hazardous materials is suggested by the fact that 69% of respondents reported being familiar with the National Response Team's "Hazardous Materials Emergency Planning Guide" (NRT-1) while 48% said that they had seen the EPA's "Technical Guidance for Hazards Analysis" and 41% said they had seen the Virginia Department of Emergency Services' "Emergency Operations Plan". Just under one third of respondents reported having attended either of two hazmat/Title III training seminars offered by the State of Virginia.

The rank ordering of members' time allocation shows once again that they see their task as primarily technical in nature and give less attention to involving or informing the public. In addition, the absolute number of hours reported suggests that the burden of LEPC service is already substantial for busy individuals and makes it difficult to see how time could be found at this stage of the process to take on a task as time-consuming as citizen participation.

In question 16 we asked members to use a five-point scale to assess their own skills in a variety of areas that could be important to their role as LEPC members. The following table shows the average rating in each category. It indicates that members generally felt confident of their abilities.

SKILL	AVERAGE RATING (out of a possible 5)
Leadership ability	4.0
Formulating plans	3.9
Public relations skills	3.9
Understanding political issues	3.8
Writing reports	3.7
Understanding technical materials	3.6
Public speaking	3.6

The ratings contain some surprises. For a group that defines its mission largely in technical terms, these members express surprisingly high confidence in their ability to exert leadership, understand political issues and relate to the public. This may reflect the influence of the large number of government officials on the LEPCs, but it clearly indicates that they feel capable of taking on a more proactive, politically-oriented role than is envisioned in their understanding of the first mission of the LEPCs. This capacity may bode well for the role of the LEPCs after the comprehensive plan is approved -- a topic we address below.

The members' confidence in their abilities probably reflects the experiences they have had that are relevant to the mission of the LEPC. Question 17 asked them to tell us how much experience they had with a variety of tasks. Their responses were organized into a five-point scale in which one represented "very little" experience and five represented "a great deal" of experience. The following table shows the percent of members who indicated substantial background (a ranking of four or five) in each area and the average ranking given by all respondents in each category.

SUBJECT	% WITH STRONG BACKGROUND	AVERAGE RATING (out of a possible 5)
Dealing with government	68%	4.0
Formulating plans	68%	3.8
Reading technical materials	60%	3.6
Dealing with the media	52%	3.6
Resolving conflicts	47%	3.4
Hazmat risk analysis	40%	3.1
Communicating technical information to the public	34%	3.0
Using a personal computer	29%	2.9

These figures are a tribute to the recruiting process used to form the LEPCs since the members bring the right experience to the job. While we expected strong planning and technical backgrounds, we were surprised to find that members reported equally strong backgrounds in dealing with government officials and the media and in resolving conflicts. Only in the areas of communicating technical plans and using personal computers (which could be a great help to response planning) do the members seem to need additional training. The combination of experiences described by members suggests, once again, that these organizations have the capacity for taking on more political roles after their plans have been approved.

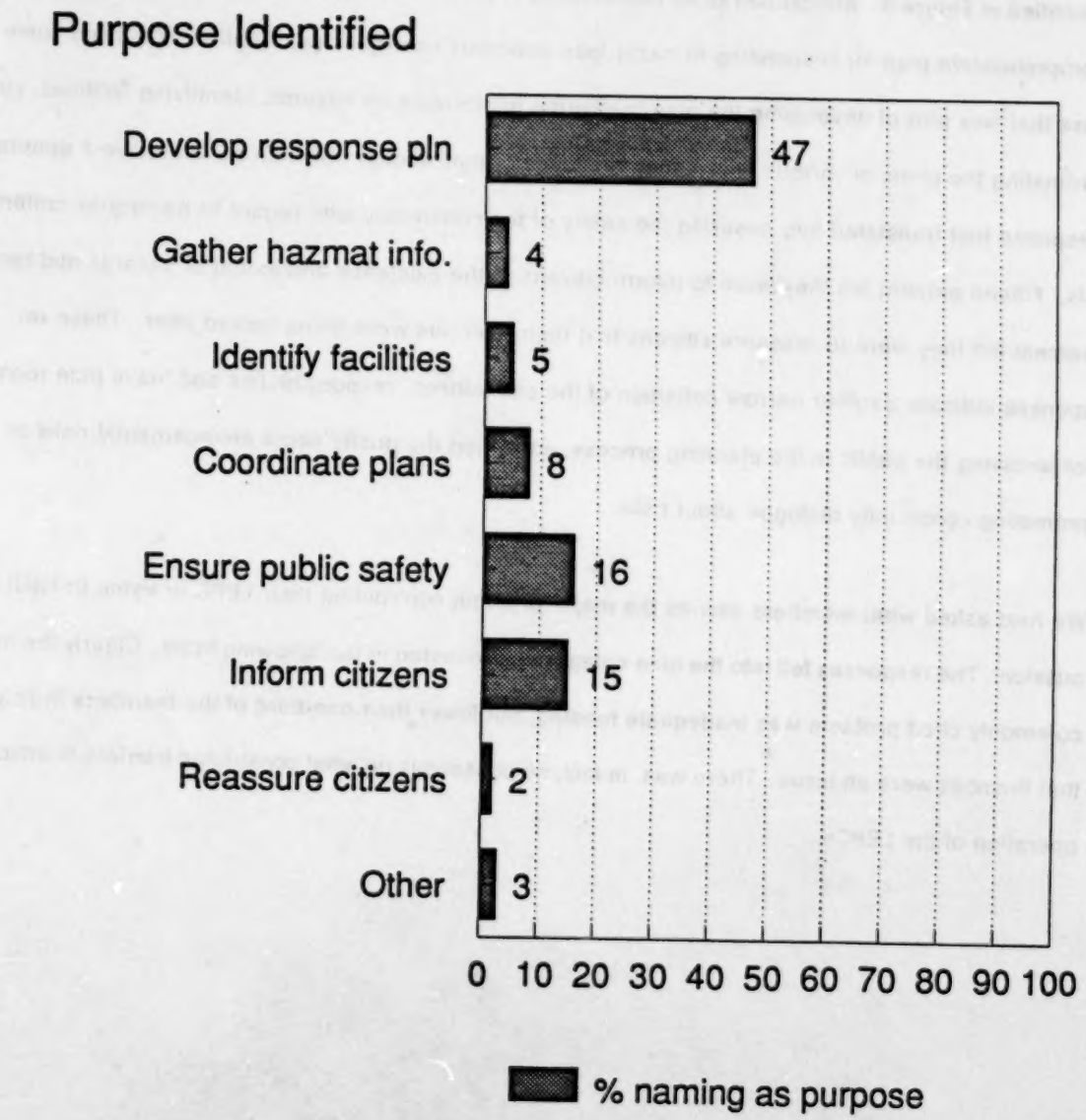
In fact, we asked them what they saw as the appropriate role for the LEPC after the plan was done. (See question 9.) Only 9% said they should stop work while 12% said they should continue to plan for emergencies, 33% said they should become involved in the implementation of the plan and 36% indicated some combination of planning and implementation. (Ten percent gave some response that did not fall into any of these categories.) This willingness to see the committees continue their work and take on new roles indicates that there is a foundation in both the attitudes and skills of members for expanding the functions of the LEPCs in the future.

Major Goals and Problems of the LEPCs

How do these LEPC members see the job of their organization? The first item on the questionnaire was an open-ended question about what the member saw as the most important purpose of the LEPC -- what major contribution it was to make to the community. Responses fell into the eight categories identified in Figure 9. Almost half of all respondents repeated the legal requirement of developing a comprehensive plan for responding to hazardous materials emergencies. Another 17% cited some task that was part of developing the plan (gathering information on hazards, identifying facilities, co-ordinating the plans of various emergency response organizations). Sixteen percent gave a general response that translated into ensuring the safety of the community with regard to hazardous materials. Fifteen percent felt they were to inform citizens of the existence and extent of hazards and two percent felt they were to reassure citizens that their interests were being looked after. These responses indicate a rather narrow definition of the committees' responsibilities and leave little room for involving the public in the planning process, educating the public about environmental risks or promoting community dialogue about risks.

We next asked what members saw as the major problem confronting their LEPC in trying to fulfill its mission. The responses fell into the nine categories presented in the following table. Clearly the most commonly cited problem was inadequate funding, but fewer than one-third of the members indicated that finances were an issue. There was, in fact, no consensus on what constituted barriers to effective operation of the LEPCs.

FIGURE 9
Perceived Major Purpose of LEPC



PROBLEM IDENTIFIED	PERCENT OF RESPONDENTS CITING
Inadequate funding	32%
Insufficient time before deadline	13%
Lack of public interest	10%
Insufficient information on hazards	9%
Inadequate cooperation from businesses	7%
Lack of cooperation from state and/or local government	6%
Complex or oppressive federal regulations	5%
Other types of problems	14%
Not aware of any problems	5%

INTERNAL COHESIVENESS

Any organization confronting issues of hazardous materials management could become a battle ground for potentially conflicting interests. Representatives of private firms or government agencies with hazardous materials may seek to conceal dangers associated with their operations for public relations purposes, try to avoid costs associated with regulation, or attempt to evade legal responsibilities, while other members of the organization seek to identify and publicize potentially dangerous situations. If such conflicts developed in an LEPC, they could render the committee ineffective in formulating meaningful plans and undercut its authority with the public that must rely on the LEPC to protect its interest. Is there evidence of deep internal divisions in the Virginia LEPCs we examined?

Rather than ask this question directly and risk getting intentionally misleading answers from image-sensitive members, we sought indirect evidence of the basis for internal divisions. We began with the 206 responding members who said that they WERE members of one of the groups or organizations listed in question 15 and divided them into four groups -- 1) those associated with an emergency response organization like a fire or police department (25% of the 206); 2) those who worked in private industry (26% of this total); 3) those who were appointed or elected government officials (29% of this

total); and 3) those who were affiliated with "watchdog" groups like the media, concerned citizens' groups or environmental interest organizations (19% of this total).

We first looked at the composition of the individual LEPCs in terms of this categorization of their members and found that most individual committees are **not** dominated by any one group. In one committee a majority of the responding members came from industry, in one case a majority came from emergency organizations and in two LEPCs a majority of the members who responded came from government. Other LEPCs either exhibited more balance or returned so few questionnaires that we could not reliably estimate their composition from the small sample. We also asked if members of any group were more likely to hold leadership positions in the committees. We found that members of government and the emergency response organizations were statistically more likely to be LEPC Chairs, subcommittee chairs or Community Information or Emergency Coordinators than representatives of industry or the watchdog groups, as the following simple table shows.

GROUP	% HOLDING AN LEPC OFFICE
Emergency	43%
Government	42%
Industry	28%
Watchdog	18%

This dominance of LEPC offices by representatives of government and emergency response groups is most logically interpreted not as bias, but as a reflection of the kinds of knowledge, experience and contacts required for the LEPCs' mission and the ease with which the work of the LEPC can be merged with members' other professional activities. Planners, fire chiefs, etc., often have responsibilities that overlap those of the LEPC.

We next turned to the more important question of whether representatives of these four constituencies differed substantially in their perceptions of or attitudes toward the LEPCs. To answer this question we relied on measures of association and tests of statistical significance. The tests of statistical sig-

nificance were used only as summary indicators since we recognize that the nature of our sampling technique renders such tests technically inappropriate for these data. To anticipate our final conclusion in this section, we found very few meaningful differences among the groups. We can present the data that show these differences and some data that reflect the pattern that dominated the cases in which we found no significant differences to help the reader understand the degree of consensus that we found in this sample of LEPCs.

Figures 10 and 11 show the extent to which members of all four groups agreed on some major questions about the LEPC. Since the differences shown are not statistically significant, these tables indicate that representatives of all four groups generally agree on the major purpose of the LEPCs, the nature of the problems they face, their capacities and the likelihood of their success in various areas.

Two of the very few areas in which we did find significant disagreements among the various groups were of substantive interest. In both cases, members from the media and environmental interest groups stood out from others in *analysis of variance* procedures. First, members of these "watchdog" groups were, significantly ($p = .04$) **less** likely to feel that a lack of cooperation from local businesses was a problem for the LEPC, as the following summary table suggests.

GROUP	% SAYING LACK OF BUSINESS COOPERATION NOT A PROBLEM
Emergency	48%
Government	54%
Industry	52%
Watchdog	70%

The second significant ($p = .03$) difference among groups came in their evaluation of the LEPCs relations with the media. Here again, members of the watchdog group were **more** positive than members of the other groups. The following summary table shows that watchdog group members were far

FIGURE 10*
AGREEMENT ON PURPOSE/PROBLEMS/FUTURE

GROUP	% IDENTIFYING PLANNING AS MAIN PURPOSE^	% SEEING FUNDING AS MAIN PROBLEM	% SAYING "STOP WORK" WHEN PLAN COMPLETE
EMERGENCY	58%	37%	6%
INDUSTRY	52%	45%	15%
GOVERNMENT	68%	35%	10%
"WATCHDOG"	55%	35%	10%

*COMPARE PROPORTIONS DOWN COLUMNS TO SEE DEGREE OF AGREEMENT AMONG GOUPS.

^COMPUTED BY COMBINING PLANNING RESPONSES TO QUESTION 1.

FIGURE 11*
AGREEMENT ON LEPC WEAKNESSES

GROUP	% RATING AS "POOR"		% RATING AS "UNLIKELY"	
	PUBLIC VISIBILITY	PUBLIC CONFIDENCE	SECURE CITIZEN INPUT	INFORM CITIZENS OF PLAN
EMERGENCY	42%	30%	29%	22%
INDUSTRY	49%	28%	20%	10%
GOVERNMENT	30%	24%	18%	13%
"WATCHDOG"	45%	39%	25%	13%

*COMPARE PROPORTIONS DOWN COLUMNS TO SEE DEGREE OF AGREEMENT AMONG GROUPS.

more likely to rate relations with the media as "excellent" and less likely to rate them as "poor" than members of the other groups.

	% RATING MEDIA RELATIONS AS	
GROUP	POOR	EXCELLENT
Emergency	10%	16%
Government	10%	28%
Industry	16%	22%
Watchdog	3%	45%

We can not determine if these differences reflect differences in the information and perceptions of individual members or are more systematic in origin, but they clearly do not suggest a situation in which members who see themselves as advocates of the public interest are alienated from the LEPC planning process in any way. "Watchdog" members do NOT seem to feel that businesses are being evasive or that the media is being intentionally excluded from committee activities. This suggests that there is a good basis for the LEPCs serving as communication bridges among the public, government and industry with regard to hazardous materials issues.

In all, our data provide evidence of capable organizations with (at this early stage of SARA's implementation) a narrow definition of their mission but strong potential for taking a more active role in facilitating community discussion of and planning for environmental risks.

CONCLUSIONS

The following conclusions are based on the findings from both the focus group discussions with the four "case study" LEPCs and data from a statewide sample of LEPC members. We have indicated the source of the data on which each conclusion is based in parentheses. In considering the conclusions, readers should keep in mind that the study was conducted at an early stage in SARA's implementation, when some LEPCs had not yet been formed and others had only recently become active for the first time.

LEPC ORGANIZATION & MEMBERSHIP IN VIRGINIA

1. LEPC membership is distributed roughly evenly among the following groups: government, business or industry, public sector emergency response organizations, "watchdog" groups, and unaffiliated members. *(questionnaire)*

2. Members are generally well-educated, long-term residents of their communities. They are more male, better educated, more professional, more likely to be associated with government, and probably more middle-aged than would be expected from a representative sample of community residents and may, therefore, not accurately reflect the values and opinions of their communities. *(questionnaire)*

3. Many members have a background in hazardous material management and/or public health and safety. They seem technically well prepared to develop the plan. *(questionnaire; focus groups)*

4. Some media representatives feel a conflict between their responsibility to participate as an LEPC member and their responsibility to report what is going on. The proportion of media representatives on the LEPCs is small and there is some evidence that their attendance rates are low. *(focus groups; questionnaire)*

5. The LEPCs have employed a variety of organizational structures, but our results do not indicate that any one structure has particular advantages. *(questionnaire)*

6. LEPCs appear to have a very limited capacity for efficiently processing information on hazardous materials in their communities. Although these LEPCs reported receiving as many as 10,000 MSDSs. very few of them had anything other than a paper record of these forms. *(questionnaire)*

MEMBERS' VIEW OF THEMSELVES AND THEIR LEPCS

1. The members express a high confidence in their ability as individuals to exert leadership, understand political issues, and relate to the public. They feel ***capable*** of taking on a proactive politically-oriented role *(questionnaire)*.

2. Despite their confidence in their individual abilities, at this stage most members are less confident regarding the chance that their LEPC will secure adequate citizen input in the development of the plan or effectively communicate the plan to citizens. *(questionnaire)*

3. Most members are confident regarding their committee's ability to develop their plan, to establish procedures for responding to citizens' requests for information, and to secure cooperation from local business and government. *(questionnaire)*

MEMBERS' VIEWS OF THE TITLE III PROCESS

1. Over half of the members perceive the major purpose of their LEPC is to develop the comprehensive emergency response plan or to perform specific tasks leading to this end. *(questionnaire)*

2. Fifteen percent feel that the major purpose is to inform citizens of the existence and extent of hazards. Two percent feel that the major purpose is to reassure citizens that their interests are being looked after. *(questionnire)*

3. Members generally view the provision of operating funds, as well as equipment and materials, from all levels of government to be inadequate and feel that they are being asked to do a difficult task with too few resources. *(questonnaire; focus groups)*

4. Members tend to rate the provision of technical information by all levels of government as adequate and to see the administrative cooperation received from state and local governments as adequate. *(questionnaire)*

PLANNING AND COMMUNICATING WITH THE WIDER PUBLIC

1. At this early stage in the process, LEPC members generally do not see communication with the public as a high priority. While this could change with completion of the initial response plan, we believe there will have to be a significant change in most members' perceptions before outreach can take on a higher priority. *(questionnaire; focus group)*

2. Some members believe that citizens are generally not interested in communications from the LEPC regarding hazardous materials emergency planning unless and until an incident takes place. *(focus group)Pehp1.*

3. *About half of the members rate their LEPCs* **ability** *to communicate with the public as high; fewer, however, rate highly the level of public confidence or public visibility currently enjoyed by their LEPC. (questionnaire)*

4. *Some members believe that firefighters in Virginia (who play an important role on the LEPCs) lack a tradition of involving the public in the formative stages of the planning process. (focus group)*

INTERNAL COHESIVENESS

1. *Most LEPCs are not dominated by members representing any single group in the community. (questionnaire)*

2. *Members representing government and the emergency response organizations are more likely to occupy leadership positions in the LEPC than are representatives of industry or the watchdog groups. (questionnaire)*

3. *Representatives of the four constituencies - government, emergency response agencies, industry, and "watchdog" groups - do not differ substantially in their perceptions of or attitudes toward the LEPCs. (questionnaire)*

RECOMMENDATIONS

The fact that our observations were confined to one state inevitabley raises questions about how broadly we can generalize from our findings. However, our contacts with LEPCs, and both SERC and EPA officials in other states suggests that Virginia's LEPCs may be quite typical of the nation as a whole. If the patterns we observed in Virginia are found in other states, then the following recommendations may be appropriate for enhancing the functioning of the local committees in the period after the initial completion of their response plans.

1. *Members should have access to training which will highlight the importance of the LEPCs' role as risk communicators to the wider public and encourage them to broaden their definition of their mission to include increasing public understanding of hazmat issues.*

2. *Materials should be developed and distributed to the LEPCs to provide them with information on how to incorporate the public into the planning process. Similarly, materials should be developed and distributed to the LEPCs to assist them in successfully communicating risk information to the public.*

3. *Support should be offered to the LEPCs to assist them in more efficiently analyzing, storing, and retrieving MSDSs and other hazardous materials data.*

4. *Guidelines should be developed to assist the LEPCs in devising workable systems for responding to citizen requests for hazmat information.*

5. *Training should be provided to the LEPCs to assist them in effectively using computers to facilitate the committees' work in planning, storing and retrieving information, and providing information to the public.*

6. *Guidance should be provided to the LEPCs to resolve the apparent conflicts of interest experienced by some media representatives by altering the selection of LEPC members or devising "operating rules" for the media-affiliated members.*

7. *While the existing process for recruiting members for the LEPCs has produced technically competent organizations, efforts should be made to expand the variety of groups represented on the committees as they move into a phase of their work which requires more communication with the public.*

APPENDIX A

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

a land-grant university

University Center for Environmental & Hazardous Materials Studies
201a Architecture Annex Blacksburg Virginia 24061 USA
(703) 961-7508 *TX:* 9103331861 VPI BKS *Bitnet:* CONN at VTVM1

April 12, 1988

TO: Virginia LEPC Chairs

FROM: W. David Conn
William L. Owens
Richard C. Rich

SUBJECT: Survey of LEPC Members

The enclosed materials are being sent to you as part of research being conducted by the University Center for Environmental and Hazardous Materials Studies at Virginia Polytechnic Institute and State University, in cooperation with the U.S. Environmental Protection Agency. Enclosed is a survey which we request that you distribute to the members of your LEPC. As you can see from the enclosed memo from Cynthia V. Bailey of the Virginia Emergency Response Council, our project has the support of the Commonwealth of Virginia, as well as the EPA.

We need your assistance to conduct this survey. Accordingly, we would be very grateful if you would do the following:

1. Read the enclosed letter from Ms. Bailey and review the survey so that you are generally familiar with it.

2. Distribute one survey to each of your members, including yourself. Note that each of the enclosed manila envelopes contains one survey, along with a copy of Ms. Bailey's letter.

   Our preference is that you distribute the survey at a meeting of your LEPC and provide approximately one half-hour at the same meeting for your members to fill it out. In any event, however you choose to handle the distribution, please emphasize the importance of completing and returning the survey to you promptly.

3. Fill out the enclosed LEPC Information Form and a survey yourself.

4. Collect the completed surveys in their sealed envelopes from your LEPC members as soon as possible, preferably at the same meeting as they were distributed (as suggested in step 2).

5. Return all of the completed surveys (still in their sealed envelopes) in the enclosed pre-stamped 10x13 envelope addressed to the University Center for Environmental and Hazardous Materials Studies. If at all possible, please mail these surveys by the end of April, 1988.

THANK YOU FOR YOUR HELP!

COMMONWEALTH of VIRGINIA

CYNTHIA V. BAILEY
EXECUTIVE DIRECTOR

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FRANK H. MILLER, JR.
HAMPTON

MEMORANDUM

TO: Local Emergency Planning Committee Members

FROM: Cynthia V. Bailey, Chair
Virginia Emergency Response Council

RE: Local Emergency Planning Committee Membership Survey

DATE: March 24, 1988

The University Center for Environmental and Hazardous Materials Studies (UCE & HMS) at Virginia Polytechnic Institute and State University has entered into a cooperative agreement with the U. S. Environmental Protection Agency to study hazardous materials risk assessment and risk communication within local communities. UCE & HMS has decided to focus the first phase of its exploratory research on the local emergency planning committees (LEPCs) which have been formed to implement the provisions of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA).

Enclosed please find a survey prepared by the UCE & HMS. Its purpose is to obtain information on the nature, composition and operation of the LEPCs formed in the Commonwealth. The survey data will be used by the UCE & HMS to determine what kinds of educational materials should be developed to assist LEPC members perform their tasks more effectively.

While your participation in this project is voluntary, I strongly encourage you to complete the survey. Your answers will provide the UCE & HMS with the ability to make meaningful conclusions and recommendations on the effectiveness of the local emergency planning process. The conclusions and recommendations of this study may ultimately affect the level of funding provided to the LEPCs for successful implementation of SARA Title III programs throughout the Commonwealth.

/bcm

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May 30, 1988

TO: Virginia LEPC Chairs

FROM: W. David Conn
William L. Owens
Richard C. Rich

SUBJECT: Survey of LEPC Members

Several weeks ago we sent you a survey for distribution to all of the members of your LEPC. We would like to thank those of you who have had an opportunity already to conduct the survey and return to us the completed forms.

If you have not yet been able to return the forms, we would appreciate your doing so as soon as possible.

You may wish to remind the members of your LEPC to give these forms back to you, for mailing in the single pre-stamped envelope which we provided. A few individuals apparently have been confused and have sent their responses directly to the Department of Waste Management.

Please do not hesitate to call if you have questions. Once again, thank you for your cooperation!

LEPC INFORMATION FORM

(To be completed by the LEPC Chair)

1. In what month and year was your LEPC officially formed? _____
2. How many members now serve on the LEPC? _____
3. How many, if any, vacant positions are there now on the LEPC? _____
4. Has your LEPC appointed a Community Information Coordinator? _____
5. Has your LEPC appointed a Community Emergency Coordinator? _____
6. On what days and at what time of day does your full LEPC usually meet (for example: The second Tuesday morning in each month)?

   _____

7. Which of the following statements most nearly describes the stage your LEPC has reached in developing a comprehensive plan for responding to hazardous materials emergencies?

   ____ Gathering information and designing the planning process.

   ____ Well into the process with a good overview of what is needed.

   ____ Getting feedback on drafts of at least parts of the plan.

   ____ Close to a final draft of the full plan.

8. Approximately how many Materials Safety Data Sheets have been submitted to your LEPC to-date? _____
9. Which of the following best describes the system your LEPC has developed for storing and recovering the information provided to it on Materials Safety Data Sheets and other forms?

   ____ A hard copy (paper) file

   ____ A fully computerized file

   ____ Combination hard copy and computerized file

   ____ No system yet in place

10. Approximately how many facilities which handle hazardous materials are supposed to be reporting to your LEPC? _____
11. On July 1, selected businesses will be required to submit a report on the amounts and types of chemicals they release into the environment. Is your LEPC interested in seeing the reports that are applicable to your jurisdiction?

    ____ YES ____ NO

12. If your LEPC has formed subcommittees, please provide the following information about each subcommittee. Attach additional pages if needed.

    1st Subcommittee title: _____

    Number of members: _____ Primary responsibility: _____

    _____

(continued on back)

2nd Subcommittee title: _____

Number of members: _____ Primary responsibility: _____

_____

3rd Subcommittee title: _____

Number of members: _____ Primary responsibility: _____

_____

4th Subcommittee title: _____

Number of members: _____ Primary responsibility: _____

_____

THANK YOU VERY MUCH FOR YOUR COOPERATION.

-- LEPC MEMBERSHIP SURVEY --

This survey is a part of research being conducted by the University Center for Environmental & Hazardous Materials Studies at Virginia Polytechnic Institute and State University in cooperation with the U.S. Environmental Protection Agency.

The purpose of the survey is to learn about the operation of Virginia's local emergency planning committees (LEPCs) and the people who serve on them. Information from the survey will help us to determine what materials should be developed to assist LEPC members in doing their job more effectively.

Your participation in the survey is entirely voluntary, and you can be sure that your individual answers will be totally confidential. However, your cooperation is essential if we are to get an accurate picture of Virginia's LEPCs. Please answer as frankly as possible. If your LEPC has been formed only recently or you just joined the LEPC you may feel that you do not have enough experience to answer some of the questions. Please feel free to leave such questions unanswered.

Please place the completed survey in the accompanying envelope, seal it and return it to the Chair of your LEPC. Your name should not appear on the survey or envelope.

A report on the results of this survey will be sent to your LEPC when it is complete. Thank you very much for your help!

.....

1. What do you see as the most important purpose of the LEPC -- What should be its major contribution to the community?

_____

_____

_____

_____

_____

2. What do you feel is the major problem your LEPC faces in fulfilling this basic purpose?

_____

_____

_____

_____

_____

3. How would you rate the degree to which your LEPC has each of the following qualities? (CIRCLE THE NUMBER THAT CORRESPONDS TO YOUR ANSWER)

QUALITY	EXCELLENT		FAIR		INADEQUATE
• Good information gathering capabilities	5	4	3	2	1
• Good capacity for analyzing information	5	4	3	2	1
• Capable and dedicated leaders	5	4	3	2	1
• Capable and dedicated members	5	4	3	2	1
• A workable system of subcommittees	5	4	3	2	1
• Capacity for communicating with government agencies	5	4	3	2	1
• Capacity for communicating with business and industry	5	4	3	2	1
• Capacity for communicating with the general public	5	4	3	2	1
• Good relations with the media	5	4	3	2	1
• High public visibility	5	4	3	2	1
• Confidence of the public in its ability to protect their interests	5	4	3	2	1

4. How would you describe your LEPC's efforts to communicate with businesses in its jurisdiction?

EXCELLENT		ADEQUATE		INADEQUATE
5	4	3	2	1

5. How would you describe the level of cooperation your LEPC receives from most businesses in the area?

EXCELLENT		ADEQUATE		INADEQUATE
5	4	3	2	1

6. LEPCs must rely on the support of various governments. Please tell us if you feel each of the levels of government provides your LEPC with enough of each of the following kinds of support by circling an "I" for "inadequate" or an "A" for "adequate" under each heading in each row. If the question does not apply to a given level, circle "N".

RESOURCE	LOCAL	STATE	FEDERAL
• Operating funds	I A N	I A N	I A N
• Technical information	I A N	I A N	I A N
• Equipment and materials	I A N	I A N	I A N
• Facilities	I A N	I A N	I A N
• Administrative cooperation	I A N	I A N	I A N

A-8

7. How likely do you think it is that your LEPC can accomplish each of of the following goals?

GOAL	VERY LIKELY		50/50 CHANCE		NOT LIKELY
• Developing a comprehensive plan for responding to hazardous materials emergencies which meets the requirements of SARA	5	4	3	2	1
• Developing this plan BY THE OCTOBER 17, 1988 DEADLINE	5	4	3	2	1
• Establishing workable procedures for processing citizens' requests for information on hazardous materials (eg: Materials Safety Data Sheets)	5	4	3	2	1
• Getting local government agencies to cooperate by making preparations to implement the plan	5	4	3	2	1
• Getting local businesses to cooperate by making preparations to implement the plan	5	4	3	2	1
• Securing enough citizen involvement in designing the plan to make it realistic and effective	5	4	3	2	1
• Informing citizens of the plan well enough that they can cooperate with it	5	4	3	2	1

8. Do you agree or disagree that the following statements accurately describe your LEPC?

STATEMENT	STRONGLY AGREE		NEUTRAL		STRONGLY DISAGREE
• Decision making power is widely shared among all members.	5	4	3	2	1
• LEPC meetings are well organized and clearly focused on specific tasks.	5	4	3	2	1
• The work load expected of members is appropriate for a volunteer organization.	5	4	3	2	1
• We have the skills and information to conduct a sound hazards analysis for most risks in our area.	5	4	3	2	1
• The LEPC makes full use of most of its members' skills and knowledge.	5	4	3	2	1
• The LEPC makes full use of MY skills and knowledge.	5	4	3	2	1

9. Which of the following best describes the role you think your LEPC will play AFTER the comprehensive preparedness plan is accepted? (You may circle more than one.)

1....Stop work

1....Continue planning for emergencies

3....Become involved in implementation of the plan

8....Other _____

10. Turning to some questions about you, how many months have you been a member of the LEPC?

_____ (NUMBER OF MONTHS)

11. Do you currently hold any of the following offices in the LEPC?

• LEPC Chair	YES	NO
• Community Information Coordinator	YES	NO
• Community Emergency Coordinator	YES	NO
• Subcommittee Chair	YES	NO

12. How many meetings of the full LEPC have you attended since becoming a member of the organization?

_____ (NUMBER OF MEETINGS)

13. How many, if any, hours do you spend on each of the following tasks for the LEPC in an average month?

TASK	HOURS
• Attending meetings of the full LEPC or its subcommittees	_____
• Planning for meetings (preparing presentations, securing speakers, etc.)	_____
• Gathering information for the LEPC	_____
• Evaluating information for the LEPC (risk assessment, mapping, etc.)	_____
• Coordinating with other organizations	_____
• Seeking public opinion on planning issues	_____
• Informing the public of LEPC activities	_____
• Attending seminars or training sessions	_____
• Studying about hazardous materials risks on your own	_____

14. A variety of materials have been developed to explain Title III and to assist the LEPCs in fulfilling their mission. Please indicate which of the following materials you have seen and how useful you found them.

MATERIAL OR PRESENTATION	HAVE YOU SEEN IT? YES	NO	HOW DO YOU RATE ITS USEFULNESS? GOOD	FAIR	POOR	CAN'T JUDGE
• "Hazardous Materials Emergency Planning Guide" (NRT-1) by The National Response Team	1	2	5	3	1	0
• "Technical Guidance for Hazards Analysis" prepared by Environmental Protection Agency	1	2	5	3	1	0
• "Emergency Operations Plan,Airborne Hazardous Substances" prepared by Virginia Department of Emergency Services	1	2	5	3	1	0
• Five-day Hazardous Materials Contingency Course offered by Va. Emergency Response Council and Va. Department of Emergency Services	1	2	5	3	1	0
• One-day Public Officials' Conference on Title III presented by the State of Virginia	1	2	5	3	1	0

15. Are you a member of any of the following types of organizations or groups?

TYPE OF ORGANIZATION	MEMBER?	
• Fire department	YES	NO
• Rescue squad	YES	NO
• Police department	YES	NO
• Hospital emergency team	YES	NO
• Industry safety team	YES	NO
• Industry management	YES	NO
• News media	YES	NO
• Elected officials	YES	NO
• Government planning agency	YES	NO
• Environmental interest group	YES	NO

16. How would you rate your own ability in each of the following areas?

SKILL	EXCELLENT		FAIR		INADEQUATE
• Public speaking	5	4	3	2	1
• Writing reports	5	4	3	2	1
• Understanding technical materials	5	4	3	2	1
• Understanding political issues	5	4	3	2	1
• Ability to formulate plans	5	4	3	2	1
• Public relations skills	5	4	3	2	1
• Leadership ability	5	4	3	2	1

17. How much experience have you had with each of the following?

SUBJECT	GREAT DEAL		SOME		VERY LITTLE
• Analyzing the risks posed by hazardous materials	5	4	3	2	1
• Dealing with representatives of the news media	5	4	3	2	1
• Reading technical or scientific reports	5	4	3	2	1
• Communicating technical information to the public	5	4	3	2	1
• Resolving conflicts among diverse groups	5	4	3	2	1
• Working with government officials	5	4	3	2	1
• Using a personal computer	5	4	3	2	1
• Formulating plans for business, government or other organizations	5	4	3	2	1

18. A variety of things can make it difficult for LEPC members to do the work expected of them. Please tell us how significant a problem each of the following potential problems actually is for you by circling the appropriate number beside each item.

POTENTIAL PROBLEM	VERY SIGNIFICANT	SOMEWHAT SIGNIFICANT	NOT SIGNIFICANT
• Finding the time for LEPC meetings	3	2	1
• Finding the time for LEPC work done outside of meetings	3	2	1
• Attending meetings which are scheduled at inconvenient times	3	2	1
• Getting release time for LEPC service from an employer	3	2	1
• Getting access to the information needed to do the job	3	2	1
• Lack of cooperation from affected businesses	3	2	1

19. For background information, how many years have you lived in this community? _____ (YEARS)

20. Which of the following describes your highest level of education?

High school graduate	1
Vocational school	2
Some college	3
College graduate	4
Post graduate work	5
Post graduate or professional degree	6

21. What is your job title? (For example: Safety director for local chemical firm; Public information officer for police department, etc.)

JOB TITLE:_____

_____

22. In which "sector" is your occupation?

PUBLIC SECTOR (government)	1
PRIVATE SECTOR (business)	2
VOLUNTEER SECTOR (Red Cross, charity hospital, etc.)	3

23. What is your gender?

_____ MALE _____ FEMALE

24. What is your age?

_____ (YEARS)

25. If you have suggestions for improving the LEPC or feel that there is important information about the LEPC for which we have not asked, please let us have any comments you want to make on the reverse side or on additional sheets.

THANK YOU FOR YOUR COOPERATION!

APPENDIX B

EVALUATION OF THE HAZARDS ANALYSIS PRESENTATION

We sought to evaluate the hazards analysis presentation provided to the LEPCs by EPA from two main perspectives:

1. We wanted to know what impact seeing the presentation had on LEPC members' opinions and perceptions with regard to a variety of issues affecting the LEPC.

2. We wanted to know how the **members** assessed the quality and usefulness of the presentation.

We asked the members of four LEPCs to complete a self-administered questionnaire before and after seeing the presentation. Copies of these instruments are attached and the reader is referred to them for details of the questions. For convenience, we will refer to **LEPC Members Questionnaire No. 1** as the pretest and **LEPC Members Questionnaire No. 2** as the posttest.

A detailed analysis of our finds will be presented in our final report on the project. Here we offer a summary of our observations and draw some general conclusions about the presentation. Since there were few systematic differences among the results obtained from the four different LEPCs, we will treat all respondents as a single sample in this summary.

Impact on Members Opinions and Perceptions

To address our first objective, we asked members to answer a series of questions about their perceptions and opinions both before and after viewing the presentation. The results can be reported as answers to seven broad questions:

1. How do members rate the importance of five tasks to the mission of the LEPC, and how does this rating change after viewing the presentation?

   This question was answered through members' responses to Item 1 on the pretest and Item 4 on the posttest. Overall, members rated four of the five tasks as highly important both before and after the presentation. The task of providing for public participation in the planning activities of the LEPC was given a lower overall rating than the other four tasks.

   The task which is most relevant to the purposes of the presentation is that of conducting a hazards analysis for the jurisdiction. At the outset, most members rated the importance of this task as roughly equal to the importance of establishing procedures for processing public requests for MSDS information, identifying facilities subject to SARA planning requirements, and evaluating the need for resources necessary to implement the emergency response plan. We can conclude that the need for hazards analysis <u>was</u> salient to members even before the presentation.

   After the presentation, members' rating of the other tasks did not change in any systematic way. There was, however, a slight increase in the overall importance rating given to hazards analysis (from just above a 4 to closer to a 4.5 on a 5-point scale in which 5 represented highly important). This suggests that members came away from the presentation with a heightened awareness of the importance of hazards analysis to the overall planning task and indicates that the presentation was moderately successful in one of its primary objectives.

2. To what degree are members confident that their organization has the information needed to formulate an effective plan for responding to hazardous materials emergencies and how does the presentation alter this assessment?

   Overall, responses to Item 3 on the pretest indicated that members were, at best, "fairly confident" of the adequacy of the information available to their LEPC. In response to Item 5 on the posttest, a number of individual members **did** increase or decrease their reported level of confidence. The increases tended to cancel out the decreases so that there was no substantial change in the overall level of confidence. However, the fact that some members reassessed their attitude toward this questions suggests that the presentation <u>did</u> stimulate thought about what kinds of information were needed to make a good plan. To this extent, it must be regarded as useful.

3. To what degree are members confident in <u>their own</u> understanding of what must be done to conduct a hazards analysis and how is this confidence affected by viewing the presentation?

Responses to Item 4 on the pretest indicated more variance in members' opinions on this than on most other questions (probably due to differences in their individual backgrounds). Overall, however, members were only "fairly confident" of their understanding at the outset. Responses to Item 6 on the posttest revealed somewhat less variance in the responses and a slightly higher overall level of confidence. This suggests that the presentation led the average member to feel as if he or she understood the requirements of a hazards analysis a little better than before.

4. How well do members feel they understand six terms related to hazards analysis and how is this understanding affected by the presentation?

   Members' responses to Item 5 on the pretest reveal substantial variance in the level of understanding both from member to member and among the different concepts. At least some members described themselves as relatively unfamiliar with each term and at least some described themselves as highly familiar with each term. "Level of concern" was the only term that was noticeably less familiar than the others. Its overall rating was between "poor" and "fair" as compared to overall ratings between "fair" and "very good" for the other terms.

   Responses to Item 7 on the posttest reveal significantly less variance in the reported level of understanding among members and among the six terms. Most of the lower ratings fell off and average ratings for all terms moved toward the "very good" end. This indicates that the discussion of these concepts in the presentation gave members the feeling that they understood the terms better than before, thought it is important to note that we did not test their actual understanding

5. What role do members think computers can play in their efforts to develop the plan and how does this perception change after the presentation?

   In general members were convinced that computers were valuable tools both before and after the presentation. Comparisons of responses to Item 6 on the pretest and Item 8 on the posttest show that there was little variation in members' opinions on this and that there was no significant change as a result of the presentation. The relatively high and uniform level of the original opinions on this issue left no room for the presentation to have much of an impact.

6. How confident are members that their LEPC can accurately judge the level of risk posed by specific situations and how is this confidence affected by the presentation?

   Responses to Item 7 on the pretest and Item 9 on the posttest indicate that members were, in general, fairly confident of their organization' ability to assess risk. A number of individuals did change their responses from the pretest to the posttest. The number who expressed increased confidence after seeing the presentation roughly equaled the number who expressed less confidence, however, so there was no significant net change in the overall level of confidence. The presentation apparently stimulated LEPC members to give serious thought to the question of how well they could assess risks but did not have a consistent effect on the conclusions they reached.

7. How confident are members of their ability to communicate risks to the general public in a form which they will understand?

   Since the presentation was not directed at increasing risk communication skills, we asked this question only in Item 8 on the pretest. Members' responses indicated that they had relatively little confidence in their ability to successfully communicate risk since the average response fell between "not confident" and "fairly confident." There were fewer positive responses to this questions than to any other on Tech evaluation. This indicates simply that members feel the need for assistance in devising ways to communicate environmental risks effectively.

Members' Evaluations

To learn how LEPC members themselves evaluated the presentation, we asked three questions about their assessment of the program in Items 1, 2 and 3 of the posttest. Before presenting the responses to those questions, we need to note two contextual issues.

First, unlike responses to the first portion of the evaluation questionnaires, there was a noteworthy difference among responses from the different LEPCs on this second portion. The difference is that Richmond respondents stood out from members of other LEPCs. As a group, Richmonders were more

critical of the presentation than others. This may relate to their individual characteristics or to the fact that the Richmond presentation was somewhat truncated at the request of the LEPC chair.

Second, in Item 2 of the pretest, we asked members what they expected to learn from the presentation based on what they knew about it in advance. Approximately one third of the members indicated that they did not know what to expect or left the question unanswered. Those who did answer had only very general expectations. Approximately half knew that the presentation was to be about hazards or risk analysis in some way. Overall, it is clear that 1) LEPC members had very little information about the presentation in advance, and 2) members of different LEPCs had NOT been given systematically different kinds of information about what to expect. Moreover, there was little correspondence between what people said they expected to learn and what they subsequently reported as the most important less from the presentation. All this suggests that advance information about the program did not significantly influence members' evaluation of it.

In Item 1 of the posttest, asked members to tell us what they found to be the most valuable thing they gained from the presentation. Most responses were unique to the individual who gave them and there was clearly no consensus. However, five general responses were offered by more than one or two members. In order to the frequency with which they were mentioned, these were:

1. How to go about conducting a systematic hazards analysis.
2. How to get started on the planning process.
3. A better understanding of the overall planning process.
4. A sense of urgency about getting the planning process underway prompted by recognition of the magnitude of the task of the LEPC.
5. An overview of the full mission of the LEPC.

Interestingly, in answering this question, only one person specifically mentioned the utility of computers in the planning process and only two gave responses which could be interpreted as referring to the use of computers.

Item 2 of the posttest asked LEPC members to rate the quality of the presentation on each of five criteria. Respondents were instructed to use a five-point scale in which a rating of 5 was excellent and 1 was poor. The criteria and results are as follows:

1. **Clarity of the main points**: 43 percent of the respondents gave the presentation a 4 on clarity while 36 percent scored it a 5 and 21 percent gave it a 3.
2. **Adequacy of the visual aids**: 53 percent of respondents scored this aspect of the presentation a 4 while roughly 20 percent rated it a 3 and 20 percent gave it a 5.
3. **Sufficient detail about how CAMEO works**: 50 percent gave this a 3 while equal numbers rated it a 2 and 4 and a few gave it a 1 or 5. This aspect received the lowest evaluation from members.
4. **Sufficient information about conducting a hazards analysis**: 48 percent of respondents scored this a 4 while roughly 20 percent gave it a 2 and 20 percent a 5.
5. **Practical usefulness to your LEPC**: approximately equal numbers of respondents rated this a 3 and a 4 with just over 40 percent in each category. Few gave it a 5 and some gave it a 2 or 1, suggesting that the practical usefulness was not altogether clear to members.

Overall, this is a positive set of responses which indicate that the members were generally satisfied with the presentation.

Finally, Item 3 of the posttest asked respondents to suggest the one change which they felt would most improve the presentation. Thirty percent of the members left this blank or wrote that they had no recommendation. There was no consensus among those who offered a suggestion. The two most common suggestions, however, were 1) to provide an actual demonstration of how CAMEO works and 2) to allow more time for the presentation. (Most of the suggestions for more time came from respondents in Richmond where the presentation was compressed.) Other suggestions which were made by more than one respondent were:

Provide more practical examples of how to conduct a hazards analysis.

Provide more detail on how to **do** a hazards analysis.

Reduce the level of sophistication of the presentation to fit the needs of an audience of lay volunteers.

Notably, only one individual's suggestions was directed at improving the way in which the presenter handled the task, suggesting that he was perceived as quite competent.

Less Structured Observations

In addition to the results of the questionnaires, we can base our assessment of the presentation both on the open-ended discussions we had with members following the program and on our own observations of the presentation.

The post-presentation discussions were most informative with regard to both the impact of the presentation and a variety of issues related to the larger mission of the LEPCs which we will address in the final report. With respect to the presentation, these discussions suggest the following conclusions:

Members who had little background in hazards assessment found the information provided to be a valuable introduction to the topic and were especially grateful for the clear definition of some terms.

Members who had a good background in hazardous materials management did not find the information from the presentation especially useful because they already knew it, but they **did** find it useful to hear how the various parts of the hazards analysis process are integrated into the overall planning process.

Most members seemed to gain three main impressions from the presentations:

1. There are procedures through which the massive task before them can be attacked systematically and there are tools available to help them in doing this. This seemed to be an empowering experience for members who had felt overwhelmed and had no idea where or how to begin. If the presentation did nothing more than give members a sense that the task was possible, it served a valuable function.

2. Hazards analysis should be viewed as a foundation for the entire planning process since much of the information needed to develop the plan will be generated in the process of conducting a through hazards analysis. The message that hazards analysis was a crucial first step seemed to come through loud and clear for most members.

3. The task is complex enough that the LEPC must get moving **very** rapidly if it is to hope to complete the plan. The presentation seemed to impart a great sense of urgency but also gave members the feeling that there were criteria to use in prioritizing decisions so that progress could be made.

On the negative side, the presentation did raise a large number of questions for its audiences. It did less to teach skills than to sensitize members to what they needed to learn. It is a good introduction for new members and can motivate members, but, as currently structured, it does nothing to actually train them to take action. Relatedly, members and especially the chairs felt that the presentation would be most useful if it could be viewed very early in the LEPC's history so that the organization could take full advantage of the orientation it suggests for organizing their work.

Our own observation of the presentation confirmed much of what was said by members. As organized, it calls for passive learning from the audience. This is never as affective in communicating information or imparting skills as a combination of information presentation and exercises. In addition, without more concrete examples, illustrations of how the ideas presented actually work and some opportunity for hands-on experience for the audience, the presentation remains at a very high level of abstraction. Educational research has consistently shown that information presented at this level has less impact on the learner and is remembered less effectively than lessons which are more concrete and require the active participation of the learner.

In addition, the relevance of the ideas and procedures to the individual LEPC was not as clear as it might have been because of the abstraction.

Summary and Suggestions

In general, the presentation must be evaluated as an effective way to introduce the LEPC members to the role of hazards analysis information emergency response plans and as a potentially good stimulus to action. For these purposes, it is well conceived. However, it is important to recognize the very limited scope of its impact. It seems to have done little to persuade members that computer programs could play a major role in their planning efforts or to "sell" any given computer program. It can not be considered "training" since it does not give members any actual skills to use in the planning process. And there is good reason to doubt that the information presented will be remembered very long by members.

How can the presentation be as effective as possible within the general limitations of its designated scope and the way it is likely to be delivered in the field? We feel the following suggestions would move in the right direction.

1. The program should be presented to LEPCs as early in their history as possible so it can inform their original conceptualization of the task before them.

2. The program should be presented only when the organization can devote at least an hour and a half to it so that there is time for question-and-answer and for more concrete examples.

3. To the extent possible, the presentation should include concrete examples of how a hazards analysis would be conducted for an actual case in the LEPC jurisdiction. This would have the advantage of making the information more concrete and illustrating the practical utility of the approach to the individual LEPC.

4. The presenter should have on-hand a computer which can be used both to show how computerized aids help in planning and to assist members in working through a hazards analysis exercise using data which is either from a local site or simulates local conditions.

5. If possible, the presentation should be offered by someone who is familiar with the individual LEPC area or, at least, can be viewed as someone who shares the concerns and problems of the LEPC rather than an "outside expert" of representative of some higher level authority.

6. If possible, the presenter should arrive early enough to talk with members to get a feel for the level of sophistication among the group, the stage of their planning efforts and the particular problems they face. He or she should then incorporate this information into the presentation whenever possible.

7. The presentation should be augmented with as many concrete examples and handouts as possible and should be designed to include at least one exercise in which members are asked to participate in actually doing elements of a hazards analysis.